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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,093	11/14/2003	Gautam Parthasarathy	134661	8210

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
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NISKAYUNA, NY 12309

EXAMINER	
RAABE, CHRISTOPHER M	
ART UNIT	**PAPER NUMBER**
2879	

DATE MAILED: 11/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/712,093	PARTHASARATHY ET AL.	
	Examiner	Art Unit	
	Christopher M. Raabe	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see p6-8, filed September 12, 2005, with respect to the rejection(s) of claim(s) 1,4,6,8,11,13 under 35 USC 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

2. With regard to applicant's argument that the Seo et al. reference (USPN 6838836) does not qualify as prior art under 35 USC 102(b), the examiner agrees and therefore the rejection is withdrawn. A new rejection is made under 35 USC 102(e) (see below).

With regard to applicant's argument that Seo et al. fail to disclose the use of a light emitting polymer, the examiner respectfully disagrees. Seo et al. do disclose the use of a light emitting polymer (see column 5, lines 30-40).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1,4,6,8,11,13 are rejected under 35 U.S.C. 102(e) as being anticipated by Seo et al. (U.S. Patent 6838836).

With regard to claim 1,

Seo et al. disclose an organic light emitting device capable of white light emissions, the device comprising at least one light emissive polymer and at least one small molecule material in two layers adjacent to each other, wherein the at least one small molecule material has a wide enough band gap and a high enough electron mobility to function as both a hole blocking layer and an electron transport layer (column 12, line 52 - column 13 line 10, and column 5, lines 30-40)).

With regard to claim 4,

Seo et al. disclose the organic light emitting device, wherein the at least one small molecule material comprises bathocuproine (BCP) (column 12, line 52 – column 13, line 10).

With regard to claim 6,

Seo et al. disclose the organic light emitting device, wherein the device has a multilayer structure on a substrate, the multilayer structure comprising a plurality of layers starting from the substrate in the following order: (a) an anode; (b) at least one hole injection layer or hole transport layer; (c) the at least one light emissive polymer; (d) the at least one small molecule material; (e) one or more electron transport layers; and (f) a cathode (column 12, line 52 – column 13, line 28, and fig 6).

With regard to claim 8,

Seo et al. disclose a method for making an organic light emitting device capable of white light emissions, the method comprising: forming a bi-layer comprising a light emissive polymer

and a small molecule material in two layers adjacent to each other, wherein the small molecule material has a wide enough band gap and a high enough electron mobility to function as both a hole-blocking layer and an electron transport layer; and incorporating the bi-layer into an organic light emitting device (column 12, line 52 – column 13, line 10, and fig 6).

With regard to claim 11,

Seo et al. disclose the method, wherein the small molecule material comprises bathocuproine (BCP) (column 12, line 52 – column 13, line 10).

With regard to claim 13,

Seo et al. disclose the method further comprising forming a multilayer structure on a substrate, the multilayer structure comprising a plurality of layers starting from the substrate in the following order: (a) an anode; (b) at least one hole injection layer hole transport layer; (c) the at least one light emissive polymer; (d) the at least one small molecule material; (e) one or more electron transport layers; and (f) a cathode (column 12, line 52-column 13, line 28, column 5, lines 30-40, and fig 6).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 2,7,9,14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seo et al. as applied to claims 1,8 above, and further in view of Duggal et al. (U.S. Pre-grant Publication 2001/003135).

With regard to claim 2,

Seo et al. disclose the organic light emitting device.

Seo et al. do not disclose an at least one light emissive polymer comprising a polyfluorene-based blue light emissive polymer.

Duggal et al. do disclose an at least one light emissive polymer comprising a polyfluorene-based blue light emissive polymer (paragraph 62).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the polyfluorene-based blue light emissive polymer of Seo et al. into the device of Seo et al. in order to provide a light emitter that lasts well (paragraph 62 of Duggal et al.).

With regard to claim 7,

Seo et al. disclose the organic light emitting device, wherein the device has a multilayer structure on a substrate, the multilayer structure comprising a plurality of materials starting from the substrate in the following order (column 13, lines 5-28, and fig 6): indium tin oxide (ITO) (column 2, lines 20-21), polyethylenedioxythiophene (PDOT) (column 7, lines 20-38), a light emissive layer, bathocuproine (BCP) (column 12, line 53 –column 13, line 4), tris(8-hydroxy-quinoline)aluminum (Alq.sub.3) (column 12, lines 53-60), sodium fluoride (NaF) or lithium fluoride (LiF), and aluminum (Al) (column 13, lines 20-28).

Seo et al. do not disclose the light emissive layer being a polyfluorene-based blue light emissive polymer.

Duggal et al. do disclose an at least one light emissive polymer comprising a polyfluorene-based blue light emissive polymer (paragraph 62).

Utilizing the reasoning in the rejection of claim 2, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the polyfluorene-based light emissive polymer of Duggal et al. into the device of Seo et al.

With regard to claim 9,

Seo et al. disclose the method of making an organic light emitting device.

Seo et al. do not disclose an at least one light emissive polymer comprising a polyfluorene-based blue light emissive polymer.

Duggal et al. do disclose an at least one light emissive polymer comprising a polyfluorene-based blue light emissive polymer (paragraph 62).

Utilizing the reasoning in the rejection of claim 2, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the polyfluorene-based light emissive polymer of Duggal et al. into the method of Seo et al.

With regard to claim 14,

Seo et al. disclose the method of making an organic light emitting device, comprising forming a multilayer structure on a substrate, the multilayer structure comprising a plurality of materials starting from the substrate in the following order (column 13, lines 5-28, and fig 6): indium tin oxide (ITO) (column 2, lines 20-21), polyethylenedioxythiophene (PDOT) (column 7, lines 20-38), a light emissive layer, bathocuproine (BCP) (column 12, line 53 –column 13, line 4), tris(8-hydroxy-quinoline)aluminum (Alq.sub.3) (column 12, lines 53-60), sodium fluoride (NaF) or lithium fluoride (LiF), and aluminum (Al) (column 13, lines 20-28).

Seo et al. do not disclose the light emissive layer being a polyfluorene-based blue light emissive polymer.

Duggal et al. do disclose an at least one light emissive polymer comprising a polyfluorene-based blue light emissive polymer (paragraph 62).

Utilizing the reasoning in the rejection of claim 2, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the polyfluorene-based light emissive polymer of Duggal et al. into the method of Seo et al.

7. Claims 3,10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seo et al. as applied to claims 1,8 above, and further in view of Adachi et al. (U.S. Pre-grant Publication 2002/0113545).

With regard to claim 3,

Seo et al. disclose the organic light emitting device.

Seo et al. do not disclose the at least one small molecule material having a lowest unoccupied molecular orbital (LUMO) value between the LUMO values of two adjacent layers of the at least one small molecule material.

Adachi et al. do disclose the at least one small molecule material having a lowest unoccupied molecular orbital (LUMO) value between the LUMO values of two adjacent layers of the at least one small molecule material (Device II of fig 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the LUMO relationship disclosed by Adachi et al. into the light emitting device of Seo et al. in order to provide a hole blocking layer that also acts as an electron transport layer.

With regard to claim 10,

Seo et al. disclose the method of making an organic light emitting device.

Seo et al. do not disclose the at least one small molecule material having a lowest unoccupied molecular orbital (LUMO) value between the LUMO values of two adjacent layers of the at least one small molecule material.

Adachi et al. do disclose the at least one small molecule material having a lowest unoccupied molecular orbital (LUMO) value between the LUMO values of two adjacent layers of the at least one small molecule material (Device II of fig 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the LUMO relationship disclosed by Adachi et al. into the method of making a light emitting device of Seo et al. in order to provide a hole blocking layer that also acts as an electron transport layer.

8. Claims 5,12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seo et al. (as above).

With regard to claim 5,

Seo et al. disclose the organic light emitting device.

Seo et al. do not disclose the at least one light emissive polymer being formed by a solution-cast process and the at least one small molecule material is formed by an evaporation process.

Seo et al. disclose forming layers by a solution-cast process and by an evaporation process (column 11, lines 60-67, and column 12, lines 1-6)

It would have been obvious to one of ordinary skill in the art at the time of the invention to form the layers disclosed by Seo et al. utilizing either of the processes disclosed by Seo et al., as both processes are well known and widely used in forming the various layers of organic light emitting devices.

With regard to claim 12,

Seo et al. disclose the method of making an organic light emitting device.

Seo et al. do not disclose the at least one light emissive polymer being formed by a solution-cast process and the at least one small molecule material is formed by an evaporation process.

Seo et al. disclose forming layers by a solution-cast process and by an evaporation process (column 11, lines 60-67, and column 12, lines 1-6)

It would have been obvious to one of ordinary skill in the art at the time of the invention to form the layers disclosed by Seo et al. utilizing either of the processes disclosed by Seo et

al., as both processes are well known and widely used in forming the various layers of organic light emitting devices.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Raabe whose telephone number is 571-272-8434. The examiner can normally be reached on m-f 7am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CR

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PRIMARY EXAMINER